

92-76 /

**ORIGINAL  
FILE**

PROPOSED AGENDA  
BELOW 1 GHz LEO NEGOTIATED RULEMAKING COMMITTEE  
August 18, 1992

1. Approval of agenda
2. Opening remarks
3. Approval of minutes
4. Election of Co-Facilitator
5. Identification of additional record information
6. Report on progress of informal working group
7. Discussion of additional/revised tasks, if any, for informal working group (Work program - LEOAC-2)
8. Update agenda for next meeting
9. Other business

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AUG 12 1992

FEDERAL COMMUNICATIONS COMMISSION  
OFFICE OF THE SECRETARY

**ATTENDEES**  
**Below 1 GHz LEO Negotiated Rulemaking Committee**  
**August 10-11, 1992**

| <u>Organization</u> | <u>Name</u>           | <u>Phone</u> | <u>FAX</u>   |
|---------------------|-----------------------|--------------|--------------|
| Commerce-ORFM *     | Richard Barth         | 301-763-4640 | 301-420-0932 |
| ARINC *             | Richard Neat          | 410-266-4143 | 410-266-2047 |
| ORBCOMM *           | Alan L. Parker        | 703-818-3762 | 703-631-3610 |
| Navy *              | William Cook (8/10)   | 703-697-5284 | 703-695-0930 |
|                     | Warren Chu (8/11)     | 202-433-2660 | 202-433-0200 |
| USAF *              | Nelson Pollack        | 202-475-1807 | 202-475-7436 |
| VITA *              | Walter Sonnenfeldt    | 703-276-1800 | 703-243-1865 |
| US Army *           | Thomas Trimmer        | 703-325-8233 | 703-325-8295 |
| LEOSAT *            | Brent Weingardt       | 301-907-6879 | 301-907-0853 |
| STARSYS *           | Alan Renshaw          | 301-459-8832 | 301-794-7106 |
| FAA *               | Carroll Sturm         | 202-267-9721 |              |
| FCC *               | Thomas S. Tycz        | 202-634-1860 | 202-653-8772 |
| Facilitator         | William A. Luther     | 202-632-7592 | 202-653-5402 |
| FCC                 | Harry Ng              | 202-634-1834 | 202-653-8772 |
| FCC                 | Kristi L. Kendall     | 202-634-7058 | 202-653-8772 |
| FMA                 | Roger Porter          | 202-475-1678 | 202-475-7634 |
| STARSYS             | Ashok Kaveeshwar      | 301-794-5010 | 301-794-7106 |
| STARSYS             | Raul Rodriguez        | 202-416-6760 | 202-293-7783 |
| STARSYS             | Ken Newcomer          | 301-794-5203 | 301-794-7106 |
| STARSYS             | Stephen Baruch        | 202-429-8970 | 202-293-7783 |
| AMSC                | Gregory L. Masters    | 202-659-3494 | 202-296-6518 |
| QUALCOMM            | Kevin J. Kelley       | 202-223-1720 | 202-659-5409 |
| LTA                 | Leslie A. Taylor      | 301-229-9341 | 301-229-3148 |
| FCC                 | Fern Jarmulnek        | 202-634-1682 | 202-653-8772 |
| FCC                 | Cecily Holiday        | 202-634-1624 | 202-653-8772 |
| OTA                 | David Wye             | 202-228-6945 | 202-228-6098 |
| CON/NTIA            | Mike Mitchell         | 202-377-1138 | 202-377-4396 |
| NTIA/SEAD           | Herbert Kobayashi     | 410-224-4302 | 301-261-8006 |
| NTIA                | Jim Vorhies           | 202-377-1138 | 202-377-4396 |
| State Dept.         | John Gilseman         | 202-647-0051 | 202-647-7407 |
| Constellation Comm. | Ron Lepkowski         | 703-548-1435 | 703-684-6440 |
| FCC                 | Peter Tenhula         | 202-254-6530 |              |
| FCC                 | Tom Sullivan          | 202-632-0923 |              |
| Motorola            | Hugh Gramban          | 202-429-6462 | 202-429-9204 |
| Aerospace Corp.     | Art Yamada            | 310-336-8816 |              |
| USAF SMC/MIE        | Capt. Edward Phillips | 310-336-4436 | 310-336-4364 |
| LEOSAT              | Joseph Roldan         | 202-296-6104 | 202-296-6142 |
| LEOSAT              | Francois Giorgio      | 202-296-6104 | 202-296-6142 |
| COMM 21 CORP        | Robert Filep          | 202-737-6789 | 202-728-6872 |

|                        |                  |              |              |
|------------------------|------------------|--------------|--------------|
| FCC                    | Robert L. Cutts  | 202-632-3214 |              |
| FCC                    | Julie Garcia     | 202-634-1841 | 202-653-8772 |
| SFA INC (AF,NAVY)      | Gerald Wigger    | 301-839-5495 | 301-839-4995 |
| JBII                   | Don Jansky       | 202-467-6400 | 202-296-6892 |
| ORBCOMM                | David Schoen     | 703-818-2846 | 703-631-3610 |
| ORBCOMM                | Paul Locke       | 703-631-3600 | 703-631-3610 |
| Orbital Sciences Corp. | Bruce Ferguson   | 703-818-2865 | 703-631-3610 |
| ORBCOMM                | Steve Goodman    | 202-371-9100 | 202-371-1497 |
| Ellipsat               | Gerald B. Helman | 202-466-4488 | 202-466-4493 |
| Motorola               | James G. Ennis   | 202-371-6931 |              |
| FCC                    | Ed Jacobs        | 202-632-7597 |              |

\* Denotes Committee Member

\*Note LEOAC Exhibits 3-7 available from Bureau  
from Kristie Kindall

List of Documents

- LEOAC-1 Public Notice "Below 1 GHz Negotiated Rulemaking Committee
- LEOAC-2 Work Program - Below 1 GHz LEO Negotiated Rulemaking Committee
- \* LEOAC-3 VITA's application - File No. \*\*\*
- LEOAC-4 Orbcomm's application - File No. 22-DSS-P-90(22)
- LEOAC-5 Amendment to Orbcomm application
- LEOAC-6 STARSYS's application - File No. 33-DSS-P-90(26)
- LEOAC-7 LEOSAT's application - File No. 12-DSS-P-91(2)
- LEOAC-8 List of IFRB Publications
- LEOAC-9 Federal Use of the 148-149.9 MHz band
- LEOAC-10 Extract from "DOC's Spectrum Sharing Study Phase 2 (Final Report)"
- LEOAC-11 CCIR Doc. 8D/TEMP/13 "Method for Determining Sharing between Stations in the Mobile Service below 1 GHz and FDMA Non-GSO Mobile Earth Stations"
- LEOAC-12 CCIR Doc. 8D/TEMP/36 "Methods for Analysing Sharing between existing Fixed and mobile and Meteorological Systems and Spread-Spectrum CDMA LEO MSS below 1 GHz"
- LEOAC-13 Charter for the Below 1 GHz LEO Negotiated Rulemaking Committee
- LEOAC-14 "Jointly Filed Comments of ORBOCOMM, STARSYS and VITA"  
CC Docket No. 92-76, dated May 18, 1992
- LEOAC-15 "Jointly Filed Supplemental Comments of ORBOCOMM, STARSYS and VITA", CC Docket No. 92-76, dated August 7, 1992
- LEOAC-16 LEOSAT Reply Comments
- LEOAC-17 Notice of Proposed Rule Making, ET Docket No. 91-280
- LEOAC-18 Extracts from Final Acts of the World Administrative Radio Conference (WARC-92), Addendum + Corrigendum to the Final Acts and from the Radio Regulations



# PUBLIC NOTICE

FEDERAL COMMUNICATIONS COMMISSION  
1919 M STREET N.W.  
WASHINGTON, D.C. 20554

24248

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News media information 202/632-5050. Recorded listing of releases and texts 202/632-0002.

August 4, 1992

## Below 1 GHz LEO Negotiated Rulemaking Committee

**Agency:** Federal Communications Commission

**Action:** Notice of public meetings.

**Summary:** In accordance with the Federal Advisory Committee Act, Public Law 92-463, as amended, this notice advises interested persons of the second and third meetings of the Below 1 GHz LEO Negotiated Rulemaking Committee ("Committee"), which will be held at the Federal Communications Commission in Washington, D.C.

**Dates:** August 18, 1992 at 9:30 a.m.  
August 24, 1992 at 9:30 a.m.

**Address:** Federal Communications Commission, Rm. 856, 1919 M Street, N.W., Washington, D.C. 20554.

**Supplementary Information:** The agenda for the second meeting of the Committee is as follows.

1. Approval of agenda
2. Opening remarks
3. Report on progress of informal working groups
4. Discussion of informal working group reports
5. Discussion of additional/revised tasks, if any, for informal working groups
6. Update agenda for next meeting
7. Other business

A more detailed agenda for this meeting will be available at the Federal Communications Commission in CC Docket 92-76 following the Committee's first meeting on August 10, 1992.

(over)

The agenda for the third meeting of the Committee is as follows.

1. Approval of agenda
2. Opening remarks
3. Report on progress of informal working groups
4. Discussion of informal working group reports
5. Discussion of additional/revised tasks, if any, for informal working groups
6. Formation of informal editorial working group to prepare the Committee's report to the Federal Communications Commission
7. Agenda for the next meeting
8. Other business

A more detailed agenda for this meeting will be available at the Federal Communications Commission in CC Docket 92-76 following the Committee's second meeting on August 18, 1992.

Members of the general public may attend these meetings. The Federal Communications Commission will attempt to accommodate as many people as possible. However, admittance will be limited to the seating available. There will be no public oral participation, but the public may submit written comments to Thomas S. Tycz, the Committee's designated Federal Officer, before the meeting.

For additional information contact: Thomas S. Tycz, Deputy Chief, Domestic Facilities Division, Federal Communications Commission, at (202) 634-1817.



# PUBLIC NOTICE

24078

FEDERAL COMMUNICATIONS COMMISSION  
1919 M STREET N.W.  
WASHINGTON, D.C. 20554

News media information 202/632-5050. Recorded listing of releases and texts 202/632-0002.

July 23, 1992

## BELOW 1 GHZ NEGOTIATED RULEMAKING COMMITTEE

**Action:** Notice of Advisory Committee Establishment.  
Notice of Advisory Committee Meetings.

**Summary:** The Federal Communications Commission has established the Below 1 GHz LEO Negotiated Rulemaking Committee (Committee). This Committee will provide expert advice and recommendations on technical matters related to the establishment and regulation of a low-Earth orbiting satellite service in the frequency bands below 1 GHz (little LEOs). The establishment of this Committee is necessary and in the public interest.

In accordance with the Federal Advisory Committee Act, Public Law 92-463, as amended, this notice also advises interested persons of the initial and proposed subsequent meetings of the Committee.

**Dates:** August 10, 1992 at 9:30 a.m.  
August 18, 1992 at 9:30 a.m.  
August 24, 1992 at 9:30 a.m.  
September 1, 1992 at 9:30 a.m.  
September 8, 1992 at 9:30 a.m.  
September 16, 1992 at 9:30 a.m.

**Address:** Federal Communications Commission, 1919 M Street, N.W., Room 856, Washington, D.C. 20554

**Supplementary Information:** The Committee was established by the Federal Communications Commission to bring together present and future applicants, and present users of the affected frequency bands, to discuss and to recommend approaches to resolve technical sharing and coordination issues involved in the establishment and regulation of a new satellite service. The FCC has solicited nominations for membership on the Committee pursuant to the Negotiated Rulemaking Act of 1990, Pub. L. 101-648, November 28, 1990, and will select members to achieve a balanced membership given the purpose and objectives of the Committee. See Public Notice in CC Docket No. 92-76, 57 Fed.Reg. 18857 (May 1, 1992), 7 FCC Rcd 2370 (1992).

The agenda for the first meeting is as follows:

1. Introductory Comments: Gerald P. Vaughan, Deputy Chief, Common Carrier Bureau; Thomas S. Tycz, Designated Federal Officer and Deputy Chief, Domestic Facilities Division
2. Selection of Facilitator
3. Approval of Agenda
4. Committee Charter
5. Committee Membership
6. Work Program
  - Tasks
  - Schedule
  - Report
7. Organization of Work
  - Identification of Available Information
  - Informal Working Groups
8. Agenda for Next Meeting
9. Other Business

At subsequent meetings, the Committee will seek to determine and to recommend approaches to resolve the domestic sharing problems among the present and future little LEO applicants, as well as among the little LEO satellite service networks and existing satellite service networks in the affected frequency bands. The Committee will also discuss international sharing and coordination issues.

Members of the general public may attend the meeting. The FCC will attempt to accommodate as many people as possible. However, admittance will be limited to the seating available. There will be no public oral participation, but the public may submit written comments to Thomas S. Tycz, the Committee's Designated Federal Officer, before the meeting.

**For Further Information Contact:** Thomas S. Tycz, Designated Federal Officer of the Below 1 GHz LEO Negotiated Rulemaking Committee, and Deputy Chief, Domestic Facilities Division, Federal Communications Commission, at (202) 634-1817.



## WORK PROGRAM

## BELOW 1 GHZ LEO NEGOTIATED RULEMAKING COMMITTEE

Develop recommendations for FCC Rules in CFR 25 that address the technical aspects related to selection and authorization of applicants to provide mobile satellite service in the frequency bands 137- 138 MHz and 400.15 - 401 MHz (space to Earth) and 148- 149.9 MHz (Earth to space) and potentially 149.9- 150.05 MHz (Earth to space).

A. Any recommendation should consider the potential sharing with the existing environment in each of the frequency bands. The rules should address:

- 1.) sharing with terrestrial services operating in the bands in the U.S. and other countries, i.e., Canada and Mexico; particularly the viability of the LEO satellite systems to operate in the presence of the existing terrestrial environment.
- 2.) the coordination of and the ability of non-geostationary mobile satellite system to operate within the same frequency band with:
  - a.) other U.S. non-Geostationary mobile satellite systems;
  - b.) Non-U.S. non-Geostationary mobile satellite systems;
- 3.) coordination of MSS satellite systems with other space services operating in the same frequency bands, including:
  - a.) Meteorological satellite
  - b.) Space Research
  - c.) Space operation
  - d.) Radionavigation satellite
  - e.) Other

B. Since there are other existing space and terrestrial radio services operating in the proposed frequency bands and the total spectrum demand of all the applications appears to exceed the spectrum allocated, recommend rules to promote multiple entry and to avoid mutual exclusivity among the applicants while maintaining the economic viability of the systems. If rules cannot be developed to avoid mutual exclusivity and to accommodate all the applications before the FCC or to be submitted in any subsequent round of submissions, recommend technical rules necessary to select and authorize specific applicants among the competing mutual exclusive applications.

- C. In light of the fact that these applications are proposing to use these bands for feeder links from the base stations as well as the service links to and from the mobile units, is there any need for and if so propose, technical rules to differentiate base stations from mobile units. For example, is it necessary to segment the band for FDMA systems for base stations and mobile stations or to reduce the return link power density for CDMA systems?
- D. Recommend rules on power density etc., to comply with the international Radio Regulations (599A, 608X, 608Y, 647X) recognizing that these technical constraints are under study within the CCIR.
- E. Recommend rules for any out of band emission requirements to protect adjacent band services and operations.

IFRB Publicationsa) ITU Articles 11 and 14

| Administration | System    | IFRB publication |
|----------------|-----------|------------------|
| F              | S80-1     | AR11/A/756       |
| F              | S80-T     | AR11/A/787       |
| USA            | LEOTELCOM | AR11/A/795       |
| F              | CERISE    | AR11/A/802       |
| URS            | UOSAT-5   | AR11/A/818       |
| F              | S80-1     | AR14/C/636-637   |
| F              | S80-1     | AR14/D/161       |

b) INTERNATIONAL FREQUENCY LIST (IFL) FOR LEO FREQUENCY BANDS

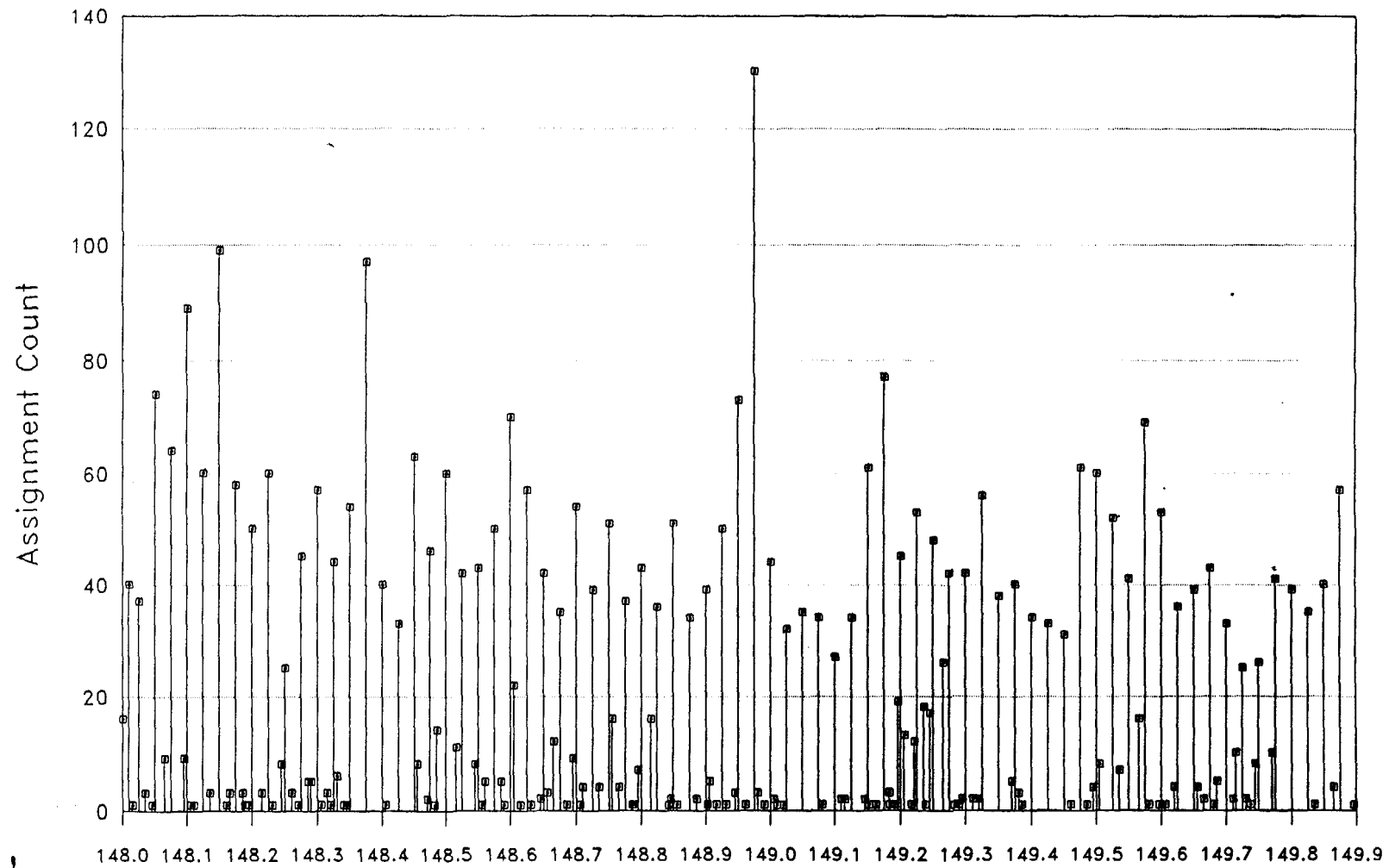
| Frequency (MHz) | Country or No. of Admin | Space Station | Earth Station | The Number of Terrestrial Assignment | Radio Astronomy |
|-----------------|-------------------------|---------------|---------------|--------------------------------------|-----------------|
| 137.-138.       | F                       | 9             | 2             | 44                                   |                 |
|                 | USA                     | 6             | 4             |                                      |                 |
|                 | IND                     | 4             | 5             |                                      |                 |
|                 | URS                     | 1             | 3             | 31                                   |                 |
|                 | CAN                     | 1             | 1             |                                      |                 |
|                 | DNK                     |               | 1             |                                      |                 |
|                 | SUI                     |               | 1             |                                      |                 |
|                 | BEL                     |               | 1             |                                      |                 |
|                 | POR                     |               | 1             |                                      |                 |
|                 | (16) *                  |               |               | 140                                  |                 |
| 148.-149.9      | CAN                     | 2             | 2             | 900 (F&M)                            |                 |
|                 | USA                     | 6             | 4             | 711 (M)                              |                 |
|                 | F                       |               | 1             |                                      |                 |
|                 | (18) *                  |               |               | 1000 (Region 2)                      |                 |
| 400.15-401.     | J                       | 10            | 4             |                                      |                 |
|                 | USA                     | 1             | 2             |                                      |                 |
|                 | S                       |               | 1             |                                      |                 |
|                 | IND                     |               |               | 11 (Met aids)                        |                 |
|                 | (7) *                   |               |               | 30                                   |                 |

\* The number in the parentheses identifies the number of countries.

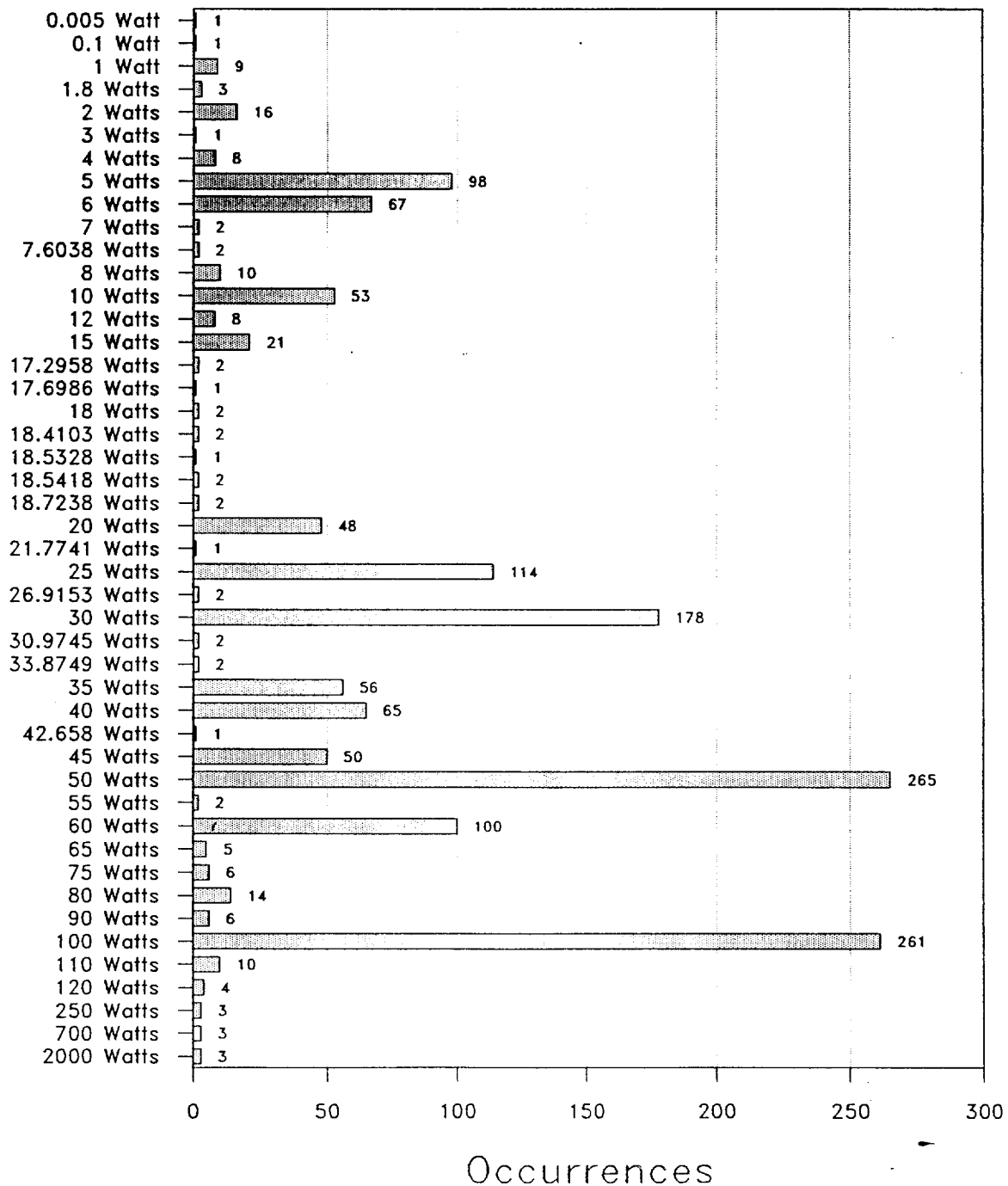
Federal Use of the 148-149.9 MHz

Attached are various frequency assignment information provided by NTIA to assist the Advisory Committee dealing with the use of low earth orbit satellites in the 148-149.9 MHz band.

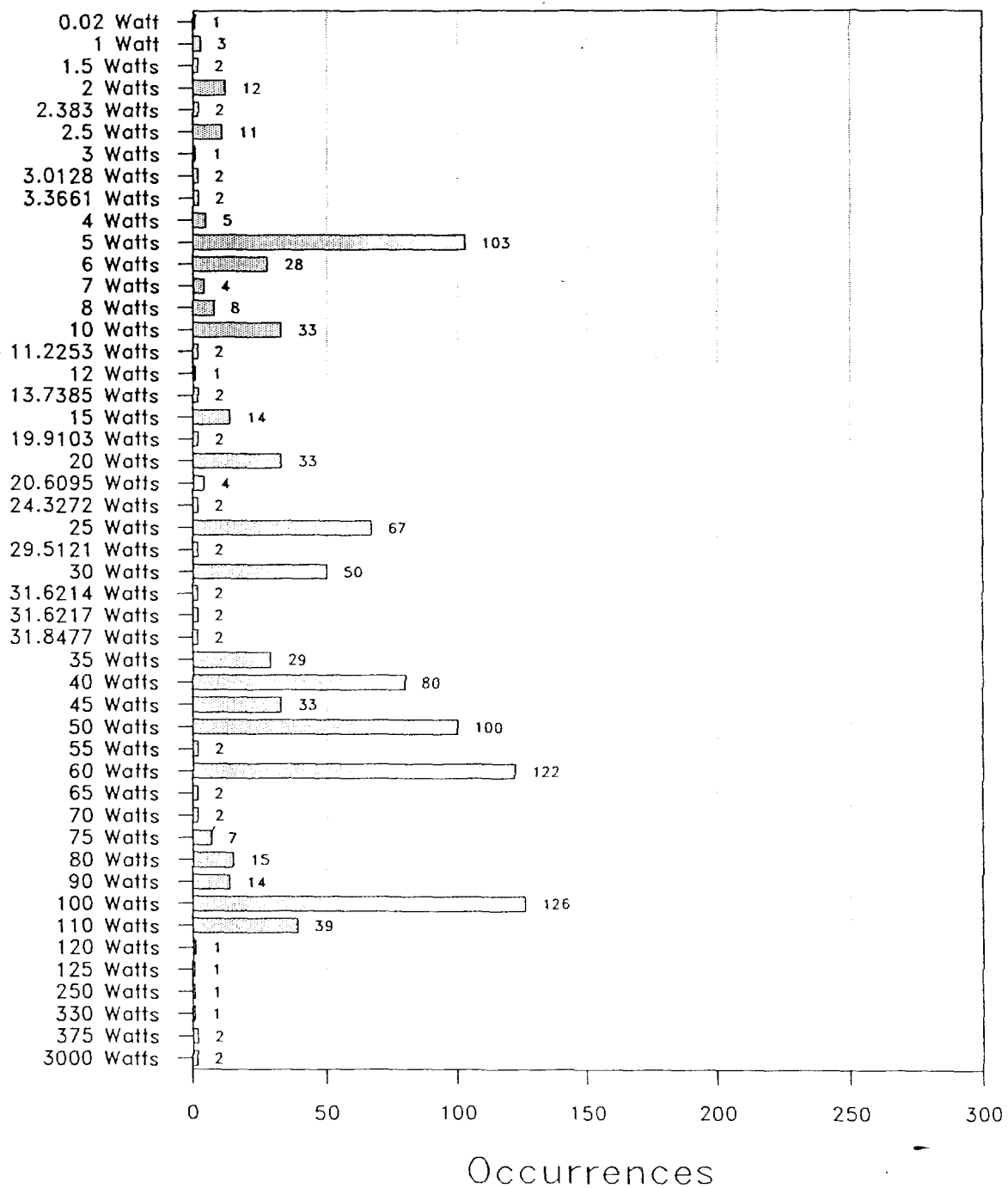
# Center Frequency Distribution for the 148–149.9 MHz Band



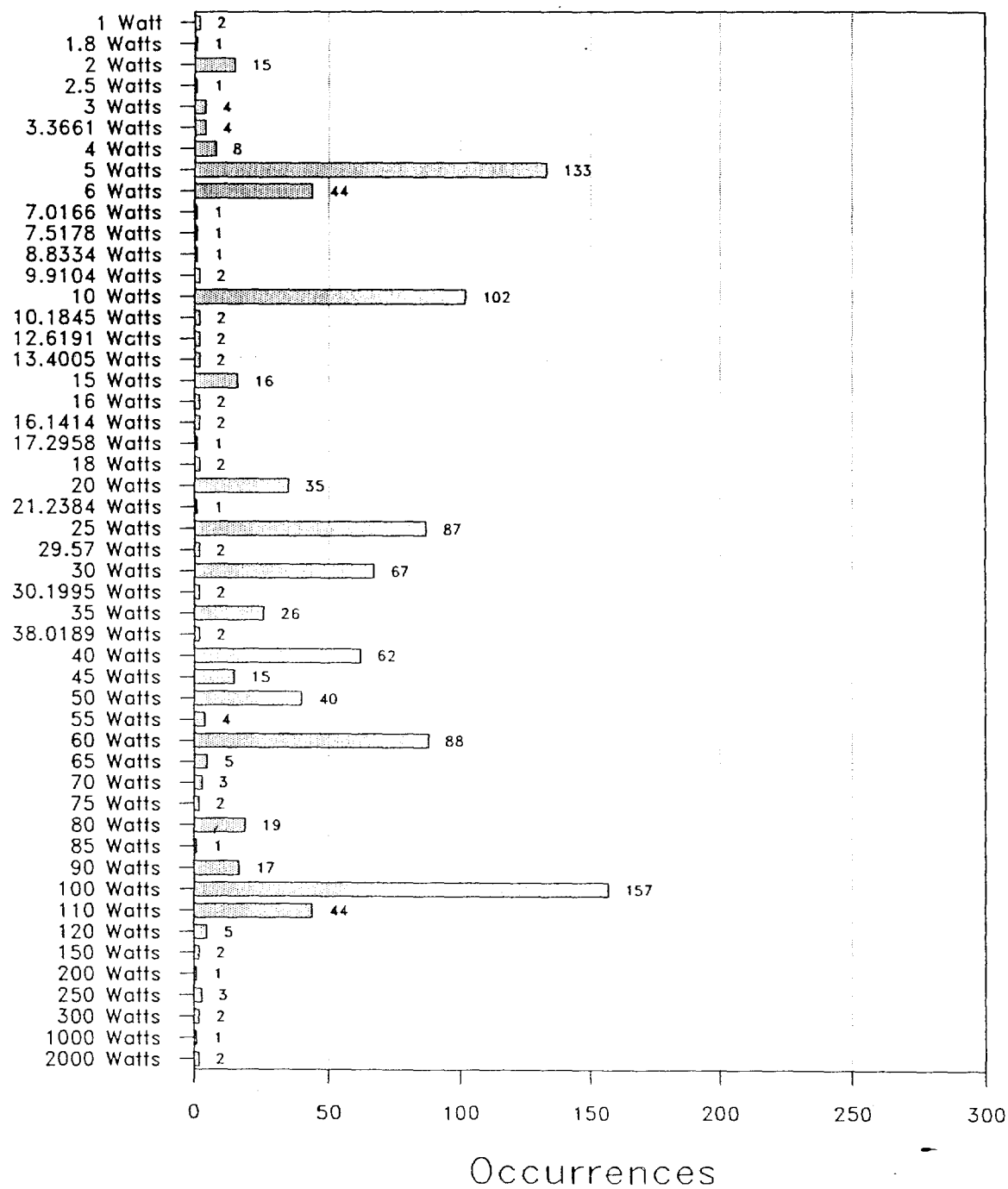
## Power Distribution for 148–148.25 MHz



## Power Distribution for 148.25–148.5 MHz

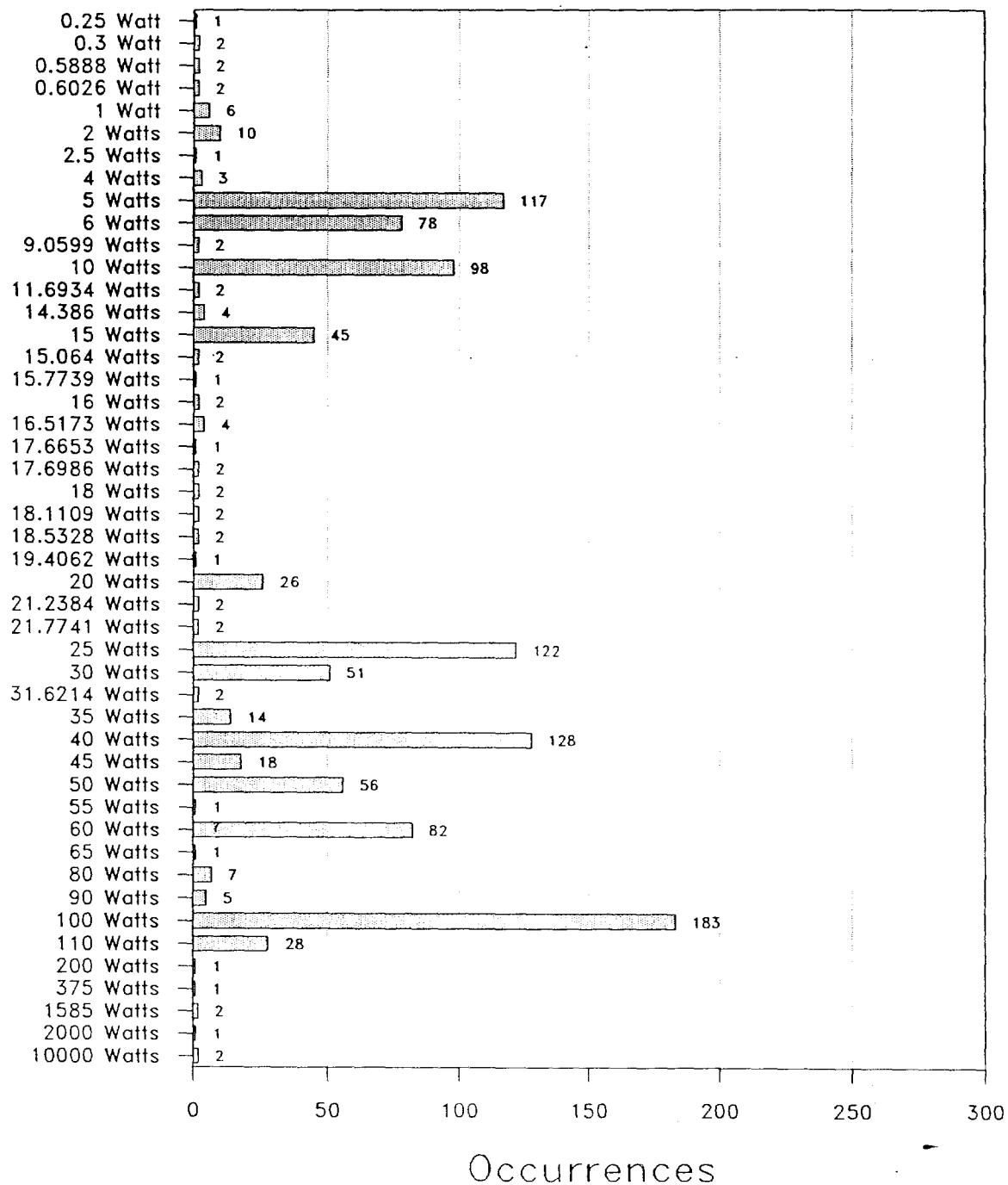


## Power Distribution for 148.5–148.75 MHz

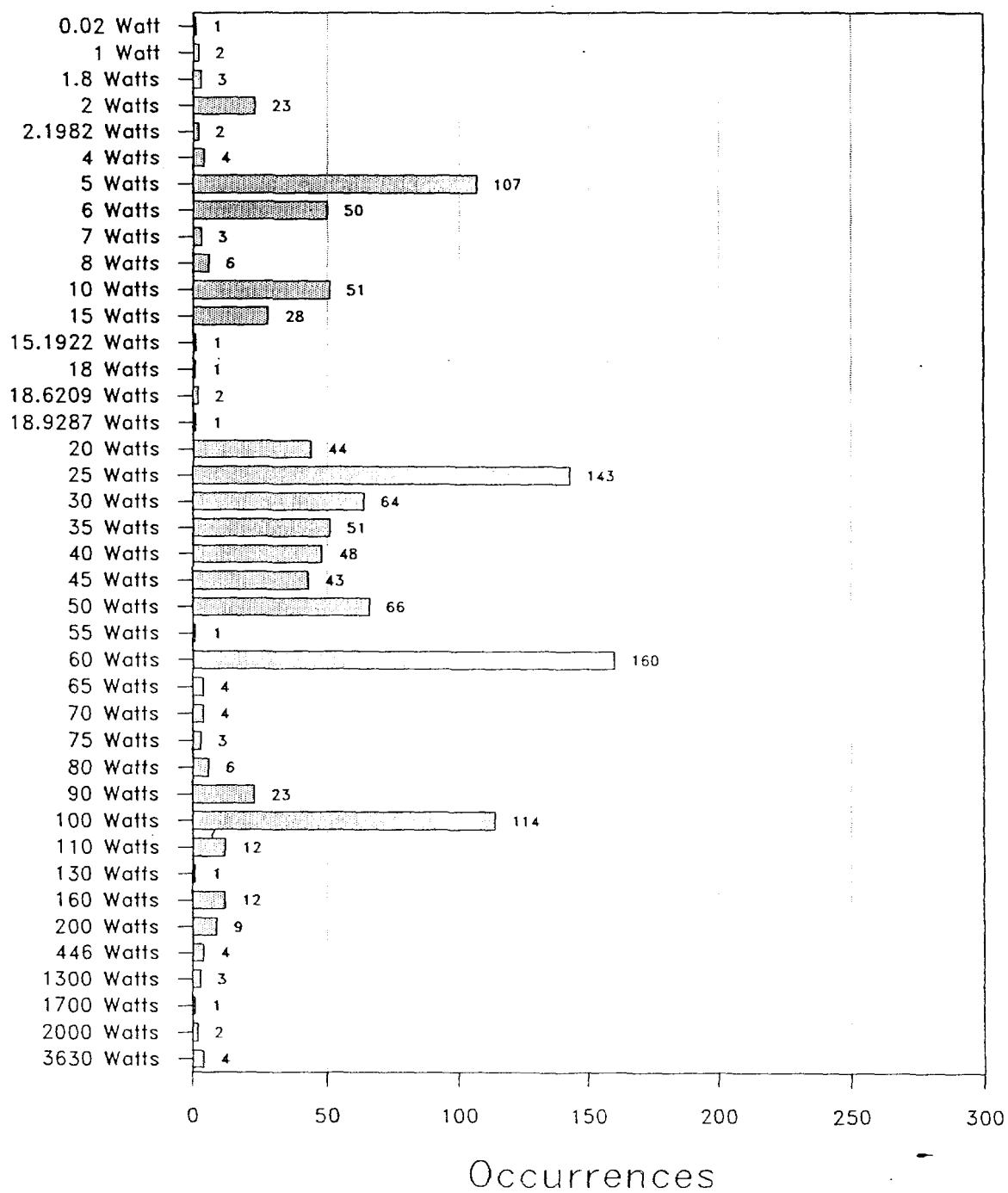




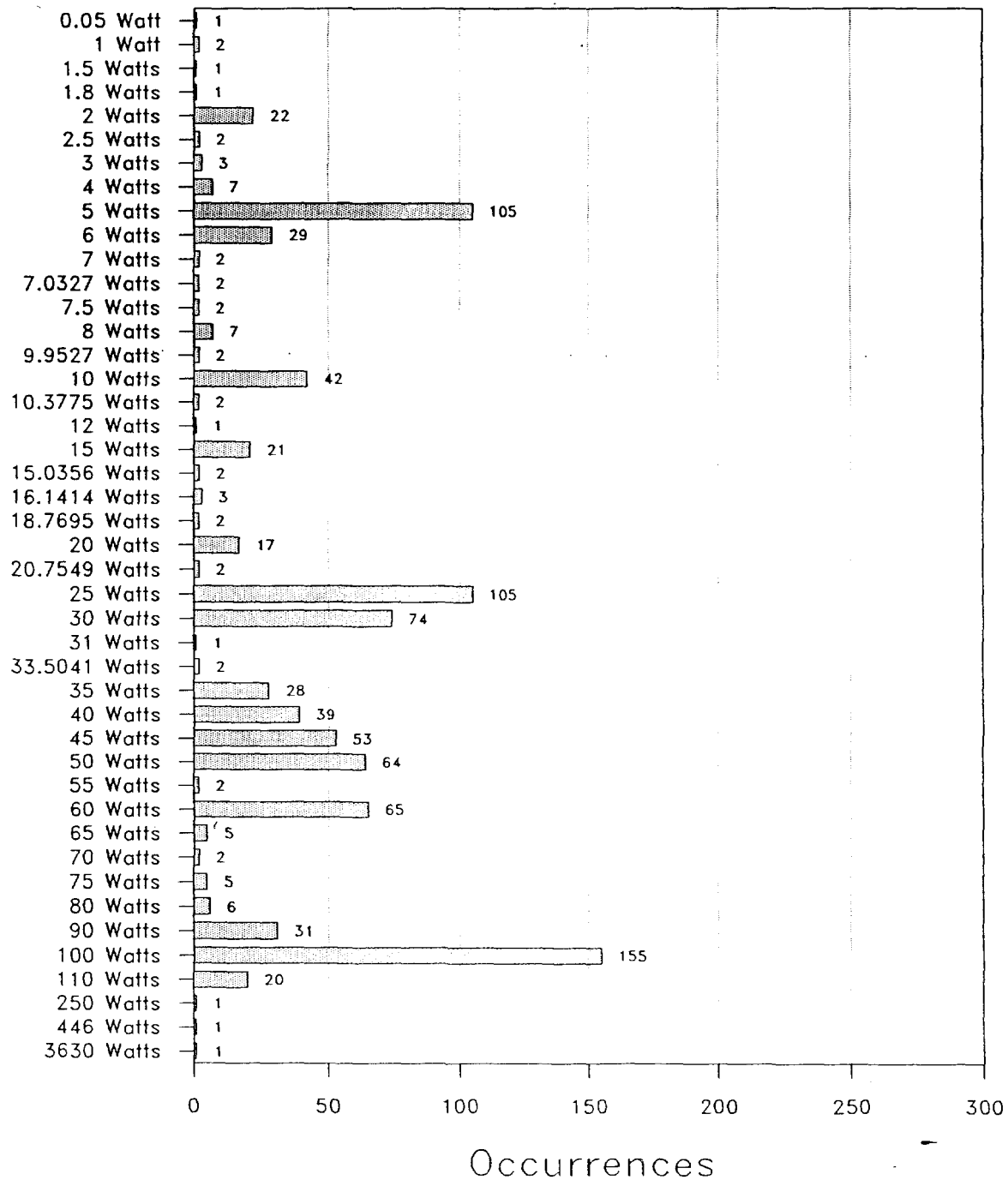
## Power Distribution for 148.75–149 MHz



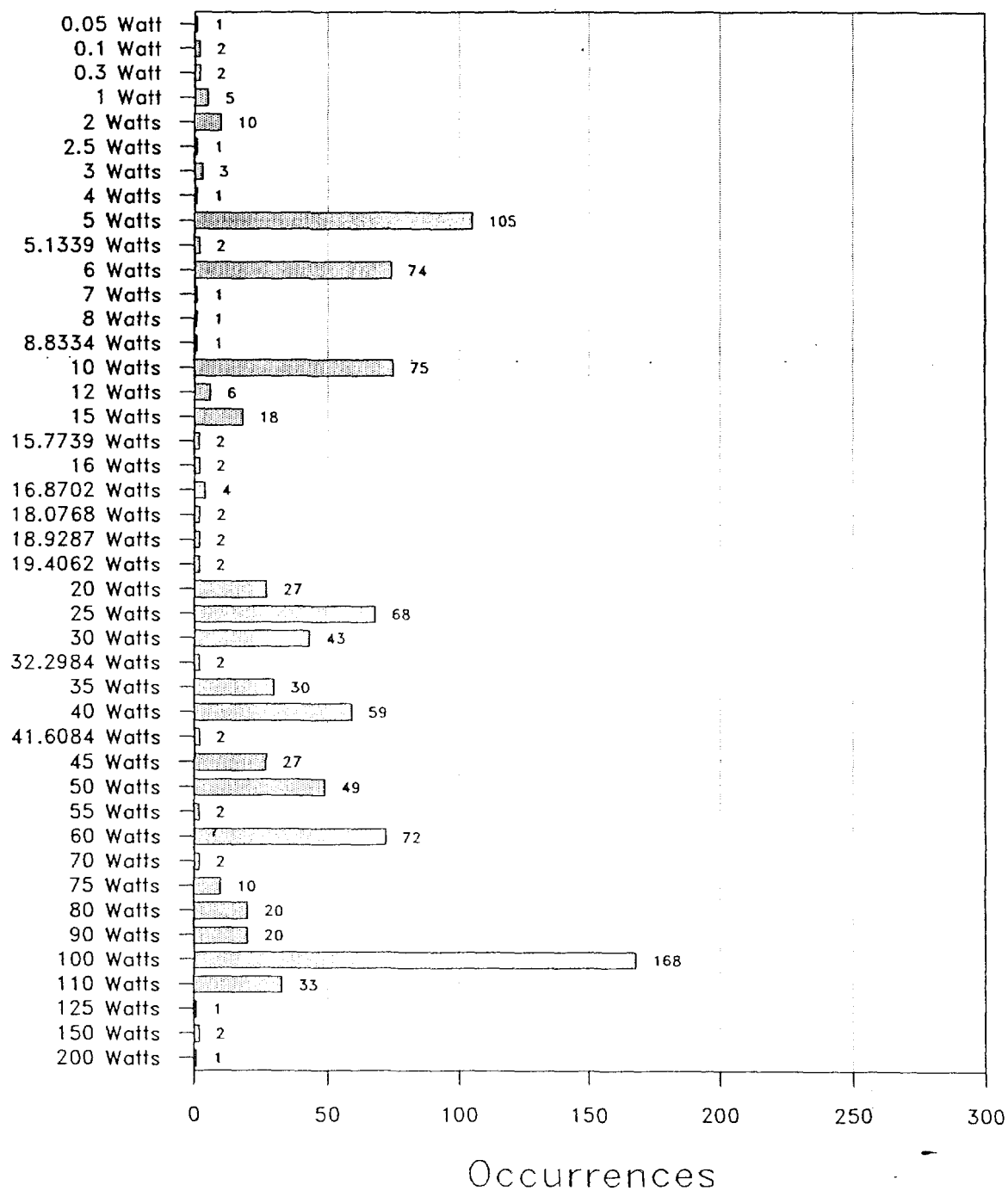
## Power Distribution for 149–149.25 MHz



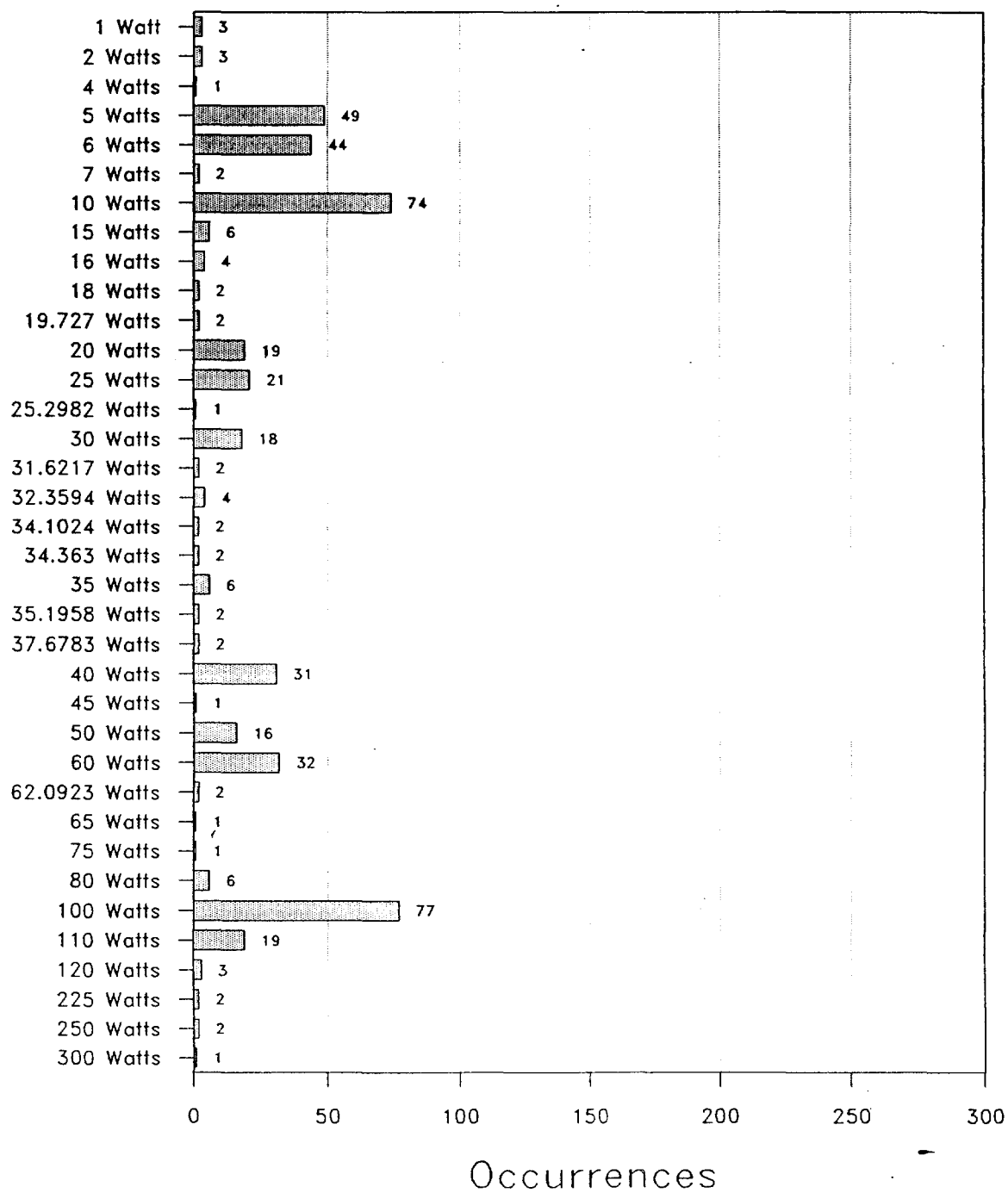
## Power Distribution for 149.25–149.5 MHz



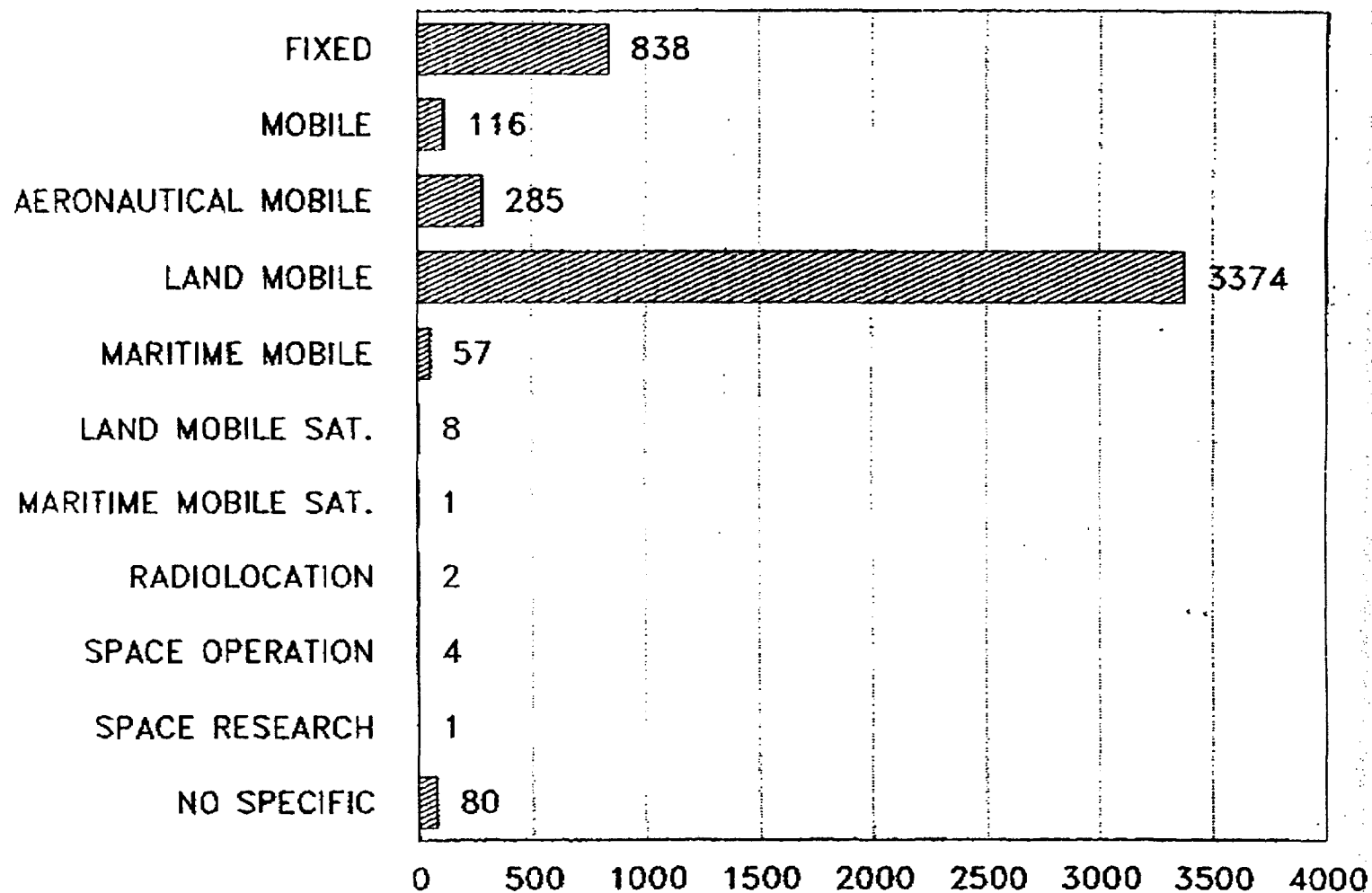
## Power Distribution for 149.5–149.75 MHz



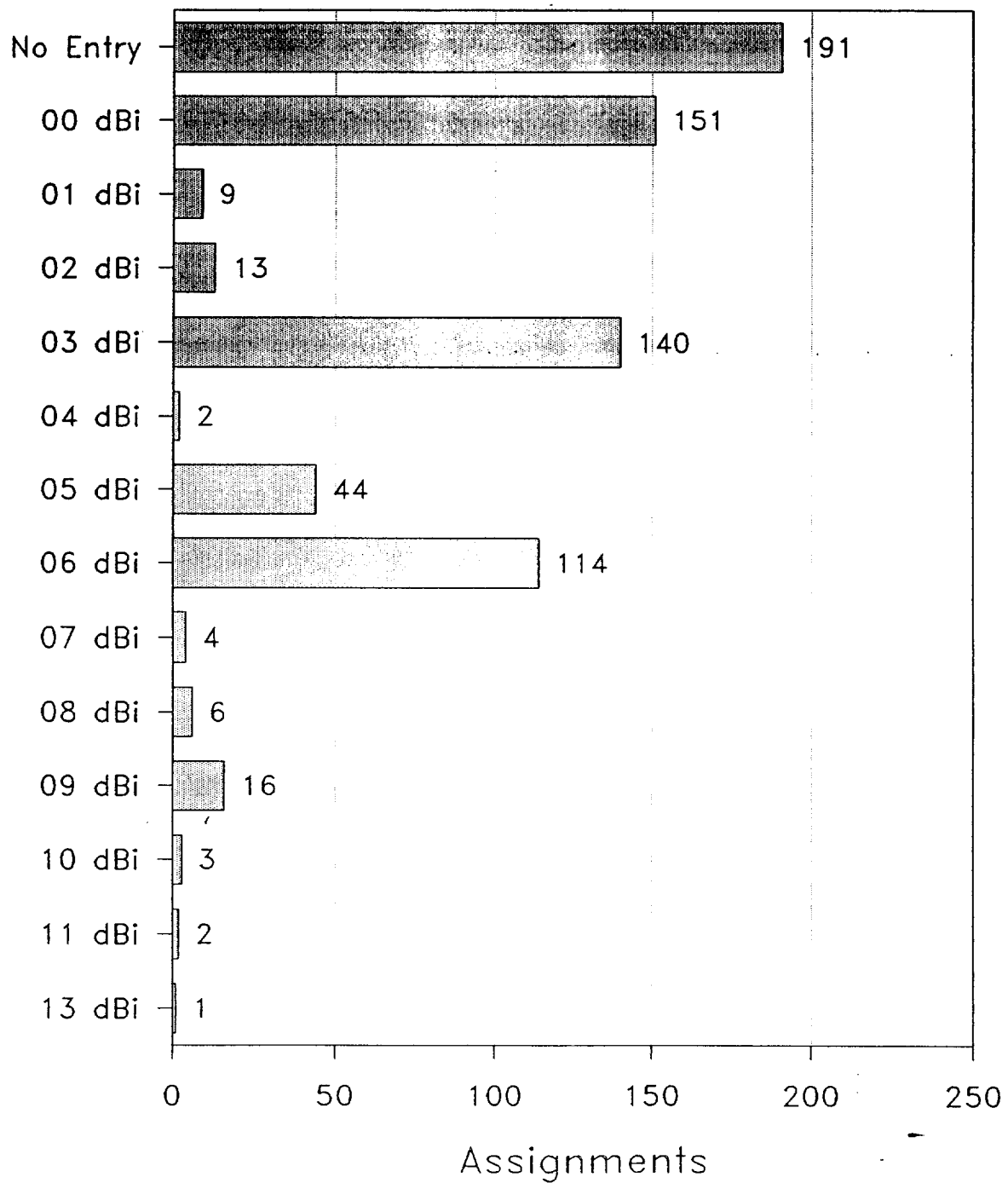
## Power Distribution for 149.75–149.9 MHz



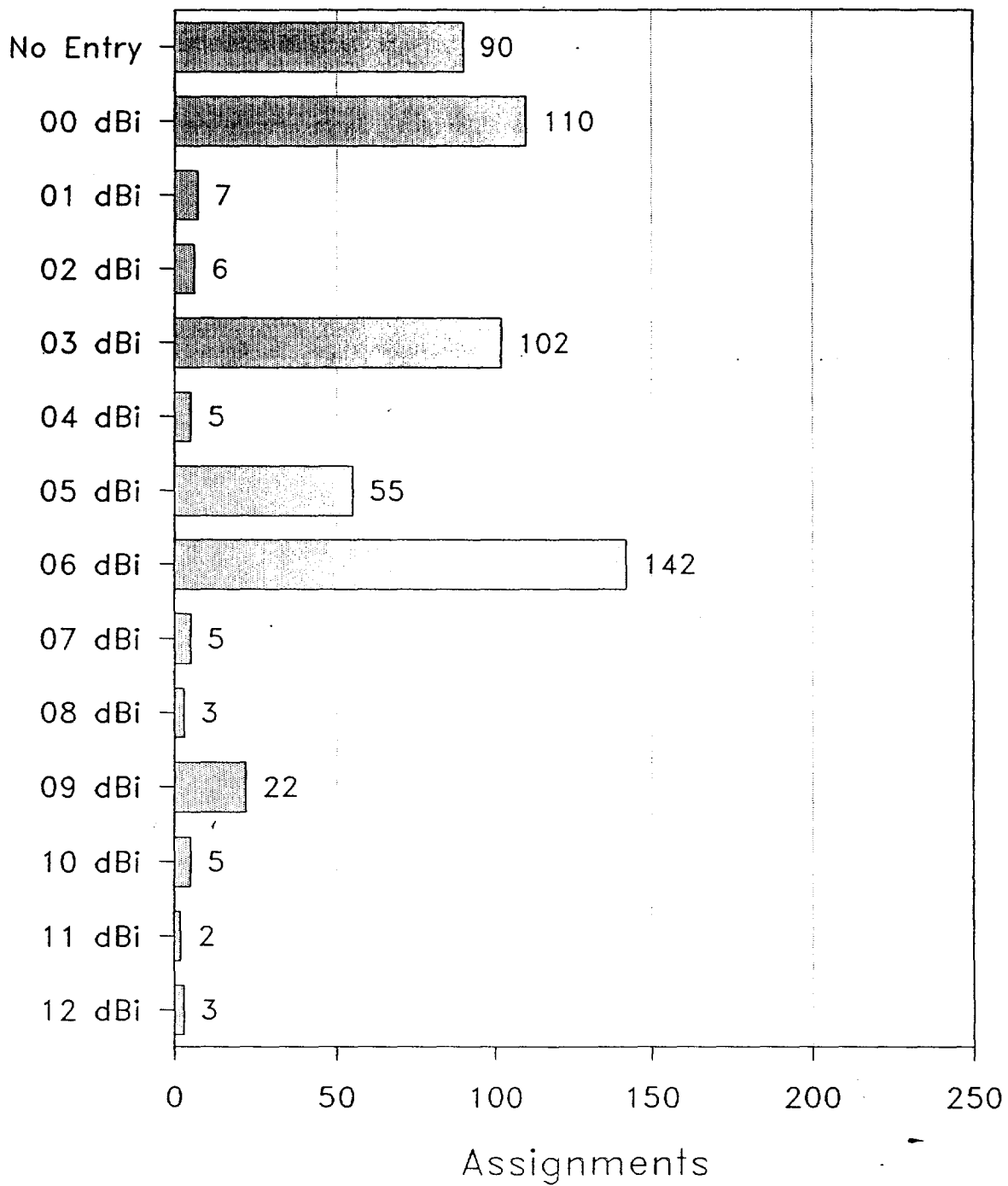
## Service Distribution for the 148-149.9 MHz Band



Transmitter Antenna Gain  
Distribution for 148–148.25 MHz



Transmitter Antenna Gain  
Distribution for 148.25–148.5 MHz





# Transmitter Antenna Gain Distribution for 148.5–148.75 MHz

